

### **REMARKS**

Entry of the foregoing, reexamination and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested.

Claims 1-13 are pending in the application. Claims 1-8 have been amended.

Claims 1, 2, 5, and 7 have been amended to recite one or more inorganic compounds other than the boehmite as fillers. Support for the amendment can be found in the original specification, at least at page 9, lines 1-11.

Claims 3, 4, 6, and 8 have been amended to recite an alumina-based compound other than the boehmite as a filler. Support for the amendment can be found in the original specification, at least at page 9, lines 15-20.

No prohibited new matter has been introduced by way of the above amendments. Applicants reserve the right to file a continuation or divisional application on any subject matter that may have been canceled by way of this amendment.

### **Objection To The Title**

The Examiner has asserted that the title of the application is not sufficiently descriptive. The title has been amended to better describe the subject matter to which the claims of this application are directed. Accordingly, withdrawal of the objection is requested.

### **Claim Objections**

Claims 3, 4, 6, 8 have been objected to because the Examiner has alleged that the recitation of “and an alumina-based compound as a filler” does not further limit the claim.

Claims 3, 4, 6, and 8 have been amended to recite an alumina-based compound other than the boehmite as a filler. Accordingly, withdrawal of the objection is requested.

### **Rejections Under 35 U.S.C. § 103**

Claims 1-13 have been rejected under 35 U.S.C. § 103 as allegedly obvious in view of U.S. Patent No. 5,443,911 ("Schreiber '911") and U.S. Patent No. 5,021,484 ("Schreiber '484") and U.S. Patent No. 3,357,791 ("Napier"). Claims 1-8 have been amended. To the extent that the rejection may be applied to the claims as amended, the rejection is traversed.

The prior art fails to establish a proper prima facie case of obviousness. To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

M.P.E.P. § 2143.

Schreiber '911 and Schreiber '484 describe a phenol resin composition comprising a phenol resin and other curable compound. The Examiner has alleged that Schreiber '911 allows that additives such as fillers and reinforcement fibers may be added to tailor the properties of the resin. Office Action, at 3, lines 4-5 (*citing* Schreiber '911, at col. 7, line 3).

The teaching at col. 6, line 67, to col. 7, line 40, of Schreiber '911 states precisely:

The properties of the polymeric resins produced as described above can be tailored for certain applications by addition of usual additives. The following additives are of particular importance:

reinforcement fibers, such as glass, quartz, carbon, mineral and synthetic fibers, in the usual forms of short fibers, staple fibers, threads, fabrics or mats;

plasticizers, especially phosphorous compounds;

carbon black or graphite;  
 fillers;  
 dyestuffs;  
 micro hollow spheres;  
 metal powder;  
 catalysts; and  
flame retardants, in particular the following groups of compounds, and  
 compounds, respectively:  
aluminium hydroxide;  
 hydrated calcium magnesium carbonate;  
 magnesium hydroxide;  
 elemental red phosphorous;  
 oxygen acids of phosphorous  
 inorganic salts of oxygen acids of phosphorous;  
 organic salts of oxygen acids of phosphorous;  
 polyphosphates;  
 boric acid;  
 salts of boric acids.

Schreiber '911, at col. 6, line 67 to col. 7, line 40 (emphasis added). Schreiber '911 refers only to "usual additives" with "aluminium hydroxide" described as a flame retardant.

It must be noted that boehmite is known as "a white to reddish brown orthorhombic mineral" (The American heritage Dictionary) or "an orthorhombic basic aluminium oxide occurring especially as a major constituent of bauxite" (The New Shorter Oxford English Dictionary). Boehmite is represented by the formula  $AlO(OH)$ . *See, e.g.*, <http://en.wikipedia.org/wiki/Boehmite>. By contrast, aluminium hydroxide is represented by  $Al(OH)_3$ . *See, e.g.*, [http://en.wikipedia.org/wiki/Aluminium\\_hydroxide](http://en.wikipedia.org/wiki/Aluminium_hydroxide). Boehmite and aluminium hydroxide are distinct chemical entities.

In this regard, the Examiner has asserted that "Schreiber '911 teaches that flame retardants, in particular aluminum hydroxide, are of particular importance as an additive. This corresponds to applicant's additional alumina-based filler." OFFICE ACTION at 5, ¶ 10. From the foregoing, it is clear that even if the aluminum hydroxide of Schreiber '911 corresponded to the additional alumina-based filler, Schreiber '911 does not teach or suggest a phenol phenol resin composition comprising a phenol resin, acicular or cylindrical

boehmite having an average particle diameter (minor diameter) of 100 nm or less, and one or more inorganic compounds other than the boehmite as fillers.

The Examiner has acknowledged that Schreiber '911 failed to teach boehmite as a filler. OFFICE ACTION at 5, ¶ 12. The Examiner has alleged that bauxite and/or boehmite "was a filler known to those of ordinary skill in the art, and could have been readily incorporated into Schreiber's invention." *Id.* The Examiner's assertion is based only on a notation in Schreiber '484 that aluminum hydroxide "is not identical with the compounds known as fillers and having the composition  $\text{AlO-OH}$  (aluminum oxide monohydrate, bauxite, et al)." *Id.* (citing Schreiber '484, at col. 4, line 3).

The combination of Schreiber '911 and Schreiber '484, does not teach or suggest the combination that is presently claimed. The Examiner has cited the only mention of aluminum oxide monohydrate or bauxite in either Schreiber reference. In this single mention of bauxite, the Schreiber '484 application acknowledges the existence of bauxite only to make clear that the teachings of the reference are not to be confused with a teaching of the use of bauxite. Schreiber '484 disclosed only a mixture of phenol resin and aluminum hydroxide, which is specifically noted as not aluminum oxide monohydrate or bauxite.

The combined Schreiber references do not suggest any reason for a person of ordinary skill to make a combination of a phenol resin, boehmite and one or more inorganic compounds other than the boehmite as is now claimed. The Examiner has not adduced any reason that might be taken from the Schreiber references to explain why the prior art might lead one to make the presently claimed combination. Moreover, the Schreiber references do not even consider the use of boehmite having the structural properties that are recited in the present claims.

Napier does not cure the deficiencies of the Schreiber references. The Examiner has contended that “Napier teaches the preparation of such boehmite particles which may be incorporated into elastomer products and plastics, such as the resin taught be Schreiber, to improve strength and/or abrasion resistance” Office Action, at 5, ¶ 13 (citing Napier, at col. 11, line 71-col. 12, line 11).

Applicants respectfully note that the portion of Napier that the Examiner has cited actually reads as follows:

Fibrous boehmite can be incorporated into elastomer products in amounts of 1-30% by weight to improve strength and/or abrasion resistance. This can be done at any point in their manufacture, including the original formation of the polymer. Generally, however, fibrous boehmite will be incorporated by conventional milling and compounding techniques commonly employed with other fillers. The elastomer in which fibrous boehmite is incorporated according to this invention can be any rubber-like polymeric material.

Fibrous boehmite can be used in plastics in manners analogous, and in amounts comparable, to those described for the use in rubber. For example, fibrous boehmite can be used as reinforcing filler in making plastic films, coatings, paints, adhesives, or other plastic articles.

Napier at col. 11, line 71-col. 12, line 11.

Applicants respectfully point out that the elastomer products or rubber-like polymeric materials are not phenol resins and fibrous boehmite is not acicular or cylindrical. The Examiner has also contended that Napier purports to disclose “a process with a great deal of flexibility with regard to the physical characteristics of the boehmite particles.” Office Action, at 6, lines 3-5 (citing Napier at col. 1, line 50). However the Examiner's citation in context actually reads:

Accordingly, it is an object of this invention to provide an alumina monohydrate of high purity. It is another object of this invention to provide a process for producing a fibrous alumina monohydrate. It is a further object of this invention to provide a simple process for preparing alumina monohydrate of the boehmite structure, which process is capable of producing particles of a wide variety of physical characteristics.

Napier at col. 1, lines 46-54. Thus, taken in context, it is clear that the flexibility that the disclosure is directed to is in processes of making and using fibrous boehmite, not acicular or cylindrical boehmite.

The Examiner has contended that Napier “teaches both blade-shaped or platelet-like shapes (corresponding to applicants acicular boehmite), (col 2 line 38) as well as long fibers (corresponding to applicants cylindrical boehmite), (col 2 line 44). First it must be noted that Napier teaches that circumstances that lead to the formation of platelet-like rather than fibrillar aluminas are to be avoided. In full context the cited passage reads:

The nonfibrous alpha-alumina monohydrate used as an intermediate is of the boehmite structure and is preferably prepared in a highly hydrated or wet form in one embodiment; the wet alumina monohydrate should not be dried or subjected to any treatment which would result in the loss of more than a few percent of its contained water. According to a second embodiment, I have observed that dry or nearly dry boehmite intermediates are disposed to form blade-shaped or platelet-like rather than fibrillar aluminas when treated with acid. Treatments such as prolonged storage or exposure to or contamination with extraneous materials are also conducive to formation of blade-shaped or short fibrous products; very long fibers of high axial ratio are best obtainable from freshly formed or carefully kept hydrated aluminas.

Napier at col. 2, lines 30-45. Since Napier is teaching one to avoid formation of platelet-like structures, Napier cannot have taught one to incorporate such structured boehmite into any polymer. Napier provides no disclosure of any benefits of incorporating platelet-shaped boehmite into any polymer. Secondly, as stated above, the fibrous boehmite of Napier does not correspond to acicular or cylindrical boehmite having an average particle diameter (minor diameter) of 100 nm or less of the present claims. Thus, Napier does not teach either the type of boehmite recited in the present claims or the combination of boehmite with a phenol resin. Consequently, the combination of Schreiber '911, Schreiber '484, and Napier fails to provide any

teaching or suggestion to make the combination that is the subject of the present claims.

Furthermore, an analysis of obviousness of a claimed combination must include consideration of the results achieved by that combination. *The Gillette Co. v. S.C. Johnson & Son Inc.*, 16 USPQ2d 1923, 1928 (Fed. Cir. 1990). Critical to the analysis is an understanding of the particular results achieved by the new combination. *Id.* (citing *Interconnect Planning Corporation v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir 1985)). None of the prior art taught or suggested the improvement of thermal conductivity, mechanical strength, kneading workability, and moldability in a phenol resin composition that are provided by the present invention. Thus, the prior art failed to provide even any basis for experimentation that might lead to the present invention.

For at least the foregoing reasons, the prior art does not support a prima facie case of obviousness regarding the claims as currently amended. Accordingly, withdrawal of the rejection is appropriate and is requested.

### **Conclusion**

In the event that there are any questions relating to this Amendment and reply, or the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

The Director is hereby authorized to charge any appropriate fees that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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